BROADCAST tools INC

Installation and Operation Manual

DC-8 Plus
Dial-Up Remote Control

Firmware version 2.12 and above

Manual Update: 07/12/2011

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INTRODUCTION

Thank you for your purchase of a Broadcast Tools, Inc., DC-8 Plus, Dial up Remote Control. We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the unit.

SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

Broadcast Tools, Inc.
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Sedro-Woolley, WA 98284 USA
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E-mail: support@broadcasttools.com

THANK YOU FOR CHOOSING BROADCAST TOOLS® BRAND PRODUCTS!

Assembled in the USA, by American Workers

CAUTION!

Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.

NOTE:

This manual should be read thoroughly before installation and operation.

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FCC NOTICE TO THE USERS

1. UPON REQUEST ONLY, you must provide the following data to your telephone utility company:

2.
a) Notice of intention to install or permanently remove an FCC Part 68 registered device/syste, and the FCC Registration Number. * SEE page 14 of this manual.
b) The Ringer Equivalence Number * SEE page 14 of this manual. Note that if several devices are connected to the same line, the REN's must not add up to more than 4.0 (A or B). This REN figure is important to your telephone utility company.
c) The *(USOC) jack type to be provided by the telephone utility company. Typically this will be RJ-11C/W for single lines.

3. This device may not be used on telco-operated coin phone lines or party lines and privately owned coin-phones, which are subject to local State regulatory policies, and possible additional State special requirements.

4. The telephone utility company has the right to make changes to their network which may affect the operation of your equipment, provided you are given adequate advance written notice to permit correct operation.

5. In case of operational problems, disconnect your unit by removing the modular plug from the telco jack. If your regular phone (or other device or system) still works properly, your DC-8 Plus has a problem and must remain disconnected and officially serviced or returned for repairs. If upon the above disconnection, your regular service still has problems, notify your telephone utility company that they may have a problem. Request prompt service at no cost to you the user. If a problem is found in premises wiring not telco-installed, you are subject to a service charge. If a fault is in telco installed wiring, you may not be subject to a service charge.

6. Unless otherwise noted in the User's Manual (e.g.: fuses, etc.), user may not under any circumstances (in or out of warranty) attempt any service, adjustments or repairs on this unit (NO USER SERVICEABLE PARTS). It must be returned to Broadcast Tools, Inc. for all such work. Broadcast Tools, Inc. address and phone information is listed on page 3 of this manual.

7. Special FCC rules apply to equipment connected behind a PBX or KTS.

NOTE:

*Items above flagged with * are noted in this manual and on the equipment's FCC Compliance label.*

GENERAL DESCRIPTION

The DC-8 Plus Dial-up Remote Control allows the user to control and monitor external devices from any touch-tone® telephone. When called, the DC-8 Plus will answer the phone line after a user programmable number of rings (up to 20), accept an access code (none to eight digits) and if valid, allow the control of six SPDT, two 2PDT relays and the monitoring of eight logic level status inputs. The DC-8 Plus is equipped with an adjustable audio hybrid, allowing the user to send and/or receive external audio, while controlling the unit; additionally, the unit is equipped with an auxiliary audio input and a mute circuit to add an optional delay unit for the removal of DTMF tones. The pager alerts function allows the activation of up to three digital pagers, by any or all of the status inputs, allowing the display of a user's defined telephone number and which status input triggered the alarm. All programming is performed with a standard touch-tone telephone. All functions may be programmed remotely, except the recall of factory defaults and setting of the access code.

ADDITIONAL FEATURES

• High Performance DTMF transceiver • Single rack chassis • CPC control, the unit hangs-up when the caller hangs-up (may be defeated) • User programmable tone acknowledgment defeat • May be configured for stand alone DTMF tone decoding • On power loss and restoration, all relays retain their prior state • Each relay may be configured to close for as long as the associated key is pressed with rising or falling edge, latching and interlocking mode • Screw style wire captive terminals for easy connection • Easily distinguishable tones indicate the high-low or open-closed status of the eight status inputs and relays • Each status input and relay may be individually polled by the user • Front panel Indicator LED's display DTMF tone detection, Hook (line-connected) status, ring signal and power • Front panel OPERATE/LOCAL switch with LED Indicator • Open collector outputs for remote Ring, valid DTMF tone and Hook (line-connected) tally • Modular connectors for the telephone line and touch-tone telephone • Front panel send and receive audio level controls • Rear panel hybrid null control • Rear panel auxiliary audio level control • Busy input, allowing the user to externally disable the DC-8 Plus from answering the telephone line

TYPICAL APPLICATIONS

The DC-8 Plus may be used in applications where remote control and logic monitoring is required. These applications may be remote recorded on a digital hard disk system, detection of DTMF tones from syndicated programs, control of Satellite receiver controllers, audio switchers/routers, automation systems, auxiliary control of broadcast transmitters, STL's, RPU's, IFB monitoring,intrusion alarm, EAS, control of remote cameras, etc.

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INSTALLING THE DC-8 PLUS

Please examine your DC-8 Plus carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package should contain the DC-8 Plus, 16.5 Vac @ 600 ma wall power transformer and this manual and modular cable.

Before permanently installing the DC-8 Plus, we recommend that you connect the unit to the wall transformer, telephone line and telephone set and become familiar with the operation of the unit. Please refer to the programming and operation section of this manual. If the DC-8 Plus is to share the phone line with a modem, the purchase of a Voice/Data switch may be in order. The modem should be connected to the modem port, while the DC-8 Plus should attach to the voice or TAD port. These units are under $60.00 at Office Max/Depot.

NOTE: *Installation of the DC-8 Plus in* ***high RF environments*** *should be performed with care. Shielded cable is suggested for all connections. Shields and station ground should be tied to the CHASSIS GROUND screw located on the far right side of the DC-8 Plus, as viewed from the rear. It is recommended that all cables connected to the DC-8 Plus be looped through ferrite cores to suppress RF.* ***Surge protection with RF filtering such as the Tripp-Lite "ISOBAR" or equivalent is also suggested for the power transformer, while the Tripp-Lite DTEL-2 is very effective for the telephone line. The purchase of an inexpensive uninterruptible power supply (UPS) will provide back up in case of power outages.***

The connection of the DC-8 Plus to a standard telephone line or cellular telephone with the appropriate interface is through the RJ-11 jack located at the far left side of the unit, as viewed from the rear. This jack is labeled "Line" and should be connected to the incoming phone line. The recessed second RJ-11 jack labeled "Phone" is for the connection of a touch-tone® telephone, used to program or operate the DC-8 Plus when in the LOCAL mode. The DC-8 Plus is supplied with a 16 to 18 volt @ 600 ma AC wall style transformer, connection from the wall transformer is made on the far right hand side of the unit, labeled **P1**. Connections on the DC-8 Plus are via screw style wire captive terminals located at the rear of the unit. Connections to the screw style wire captive terminal should be made using 20 AWG or smaller solid or stranded wire. Strip off approximately 7/16" insulation from the connection end of the wire, insert the bare wire end into the opening of the desired terminal and tighten the locking screw with a small screw driver. The relays are denoted as K1 through K8. K1 and K2 are 2PDT relays, while K3 through K8 are SPDT. JP1 is provided to tie K1 and K2 together. The normally open contact is noted as **NO**. The normally closed contact is labeled **NC** and the wiper (common) is denoted as **CM**. This convention holds true for all eight relays. The three open collector outputs (ground sink) are rated at 24 vdc @ 60 ma and are diode protected. The collectors are available at each labeled terminal, while the emitters are tied to DGND.

NOTE: *For safety, do NOT connect 120VAC circuits to the RELAYS.*

CAUTION!

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Each “STATUS / PAGER ALERT” and BUSY input is provided with two terminals, a ground terminal labeled “DGND” and input terminal labeled (IN-# / BUSY). These terminals may be connected to any pair of switch contacts, such as external relays, switches, open-collector circuits or 5-volt logic signals.

All inputs have the same common. This common is not connected to the power-main ground since the AC wall transformer is isolated; however, the input common is internally connected to the circuit ground and the aluminum enclosure of the DC-8 Plus via a parallel .01 uf cap and 10 ohm resistor. A chassis ground screw is provided at the rear far right side of the chassis.

Audio connections on the DC-8 Plus are labeled "Out-", "Out +", "In-", "In+", “Aux-“, “Aux+, DL In and DL Out”. Shields may be tied to the “EGND” terminal. The audio input is labeled TEL - and TEL + and is active balanced and accepts levels from -10 to +24dbu. The send level may be adjusted from the front panel, while this input may be turned on and off via touchtone commands.

The balanced output terminals are always active and labeled OUT – and OUT +. The front panel level control has a range of +4 dbu to OFF.

The balanced Auxiliary input is labeled AUX – and AUX + and feeds the DTMF decoder directly and may be adjusted by the “AUX” control on the rear panel. The telephone hybrid null control (R23) is adjusted on the rear panel.

The terminals labeled DL IN and DL OUT are for the user supplied delay unit.

NOTE: *Overloading the send or aux audio inputs, may cause erratic DTMF operation.*

PROGRAMMING AND OPERATION

The Broadcast Tools DC-8 Plus may be operated and programmed either remotely via telephone, or while the OPERATE/LOCAL switch is depressed. Either way, all programming and operation is identical. The DC-8 Plus Command Grid and Programming Commands may be found on pages 9, 10 and 12 of this manual, illustrating the programming and operational functions of the DC-8 Plus. Let’s take a brief run through of the operation of the DC-8 Plus. Using a touch-tone telephone, dial into the telephone number attached to the DC-8 Plus. After 3 rings, the DC-8 Plus will answer the line and reply with a "BLEEP". Access to the DC-8 Plus status-monitoring functions are possible after the access code has been entered (Default access code *1234). If the correct access code has been entered, the DC-8 Plus will reply with a DOUBLE "BLEEP". To control and monitor to DC-8 Plus the control must be entered (Default access code **).

NOTE: *The ”MONITORING ” ACCESS CODE is entered as follows: (STAR) * xxxxxxxx the factory default is *1234*

NOTE: *THE "MASTER" (MONITORING and CONTROL) ACCESS CODE is entered as follows: (STAR)* (STAR) * xxxxxxxx The factory default is ***

NOTE: *When the DC-8 Plus receives a call, the red "RING" LED will light and the rear panel RING open collector will go low each time the ring signal is detected.*

NOTE: *The call will be answered after the user-programmed number of rings. At this time, the "HOOK" LED will light and the rear panel HOOK open collector will go low.*

NOTE: *The DC-8 Plus will hang-up if the following conditions occur:*

1 - If more than 1 minute has elapsed before a correct access code is entered.
2 - If no commands are detected for 1 minute. CPC defeated.
3 - If the calling party hangs up.
4 - If command 99* (star) is entered.

CONTROLLING, OR POLLING THE RELAYS

Relays may be selected by entering the appropriate relay number. This command will produce a relay action for as long as the key is held. If you prefer a latching contact closure, enter the # (pound) key, the relay number, followed by the * (star) key. Performing this function will latch the relay into the "on" mode. To unlatch a relay contact, enter the * (star) key, relay number, and the * (star) key. Performing this function will return the appropriate relay to an "off" or unlatched mode. If you have selected the interlock mode, only one relay may be latched at any one time. After each command, a double bleep will be heard acknowledging completion of the command. If an error tone (three warbles) is received, re-enter the command. In order to check the status of any relay, simply press the # (pound) key, followed by the TWO DIGIT relay number, and the * (star) key. A high tone will be heard if the relay is closed and a low tone if the relay is open. Follow the format provided with the DC-8 Plus COMMAND GRID.

NOTE: *During a power outage, when power is returned, latched relays will return to their pre-power outage position.*

POLLING THE STATUS INPUTS

In order to check the status of any STATUS / PAGER ALERT input, simply press the * (star) key, followed by the TWO DIGIT status number, and then the * (star) key. In the event the status input condition is in a (> + 2.5 vdc) "high" condition, a high tone will be heard. In a "low" (ground) status condition, a low tone will be heard. After each command, a double bleep will acknowledge completion of the command. If an error tone (three warbles) is received, re-enter the command. Follow the format provided with the DC-8 Plus COMMAND GRID.

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BUSY INPUT

The busy input allows a user to remotely disable the DC-8 Plus from answering a call. By asserting this input low, no calls will be answered.

PAGER ALERT

The DC-8 Plus includes the ability to call up to THREE outside telephone (pager) numbers in the event any or all status inputs go "LOW" for 2 seconds or longer. As shown in the DC-8 Plus Command Grid, the Pager Alert function can be activated or deactivated by entering 951 * (star), (turns on function), or 950 * (star) (turns off function). The user may configure any or all of the eight status inputs to trigger a pager alert, by inserting the desired status input numbers in program 954, i.e. 9541* (star). (Status input one being asserted low will cause an alert.) In order to program the first call out telephone number, enter 961, followed by the FIRST telephone number to a digital pager or other service. Enter 962, followed by the SECOND telephone number to a digital pager or other service. Enter 963, followed by the THIRD telephone number to a digital pager or other service. Not all of the pager need be entered. In the event you would like the call back number to be displayed on a digital pager, enter 97, followed by the return (call back) number that will display on the pager. The DC-8 Plus will place as the FIRST digit, the FIRST STATUS / PAGER ALERT input that caused the ALERT. To provide added reliability, the DC-8 Plus dials the pager number twice. If your Telephone Company provides CALLER ID (ANI), this may be a simple way to replace the pager, when using the pager alert.

NOTE: *Any programming (EXCEPT THE ACCESS CODES and DEFAULT SETTINGS!!) can be performed either in LOCAL mode, (OPERATE/LOCAL button depressed), or when connected via telephone. Please remember to DISENGAGE the front panel OPERATE/LOCAL switch, when you are finished programming the DC-8 Plus.*

NOTE: *If the DC-8 Plus is left in LOCAL mode, the DC-8 Plus will not answer incoming calls.*

To hang up and return to the stand-by mode, either hang up or enter 99, followed by the * (star) key.

DC-8 Plus COMMAND GRID

This manual has provided many programming and operational functions of the Broadcast Tools DC-8 Plus Dial-Up Remote Control. By using the DC-8 Plus Command Grid, additional programming and operation functions are available to customize the DC-8 Plus to fit many needs. We hope that like many other users of Broadcast Tools products, you too will encounter many years of reliable and versatile use.

1 Khz Tone 10 sec's.	Relay *ON*	Latch Relay *ON*	Latch Relay *OFF*	Turn Send Audio *ON*	Turn Send Audio *OFF*	Send Indv Relay Status	Send Indv Input Status	Group Relay Latch	Group Relay Un-Latch
	1	#1*	*1*			#01*	*01*		
	2	#2*	*2*			#02*	*02*		
	3	#3*	*3*			#03*	*03*		
	4	#4*	*4*			#04*	*04*		
	5	#5*	*5*			#05*	*05*		
	6	#6*	*6*			#06*	*06*		
	7	#7*	*7*			#07*	*07*		
	8	#8*	*8*			#08*	*08*		
9*				#9*	*9*			#09*	*09*

= Clear Error or Start Over.

PROGRAMMING COMMANDS

901* = Auto Answer on first ring, NO access code, Audio ON (Auto coupler mode).

900* = Mode 901 off. (Default)

911* = Turns relay **INTERLOCK** mode **ON**. ONE latched relay ON at a time.

910* = Turns relay **INTERLOCK** mode **OFF**. (Default)

92xx* = Number of rings to answer, 00 = Never Answer. (Default = 3 rings) Maximum of 20.

93xxxxxxxx* = **Program Access code.**
Access code may be 0 to 8 digits, followed by an asterisk (*).

NOTE: *Can only be changed in LOCAL MODE.*

941234* = **Resets** all configuration information to factory **defaults.**

NOTE: *Can only be entered in the LOCAL MODE*

951* = Turns **ON PAGER ALERT** function. Dials out twice for each pager.

950* = Turns **OFF PAGER ALERT** function. (Default)

952* = Turns **OFF CPC**. Reverts back to a 30 second time-out on hang-up if no activity is detected.

953* = Turns **ON CPC** function. The DC-8 PLUS hangs up when the caller hangs up. (Default)

954x[#x]* = Pager Alert Status input configuration. Enter the status input number(s) to trigger the alert. i.e.: 9541#3* turns on inputs 1 and 3, while 9541* turns on input 1 only. The pound sign is used to separate more than one input.

961x..x* = Telephone number ONE to dial. (Up to 20 digits) # = 1 second pause. (Default, NO number) ***Example:*** 96112069384433*

962x..x* = Telephone number TWO to dial. (Up to 20 digits) # = 1 second pause (Default, NO number) ***Example:*** 96212069384433*

963x..x* = Telephone number THREE to dial. (Up to 20 digits) # = 1 second pause. (Default, NO number) ***Example:*** 96312069384433*

97x..x* = Telephone number to be displayed on a digital pager. Up to 25 digits. (Default, NO number) ***Example:*** 9712069974343*

NOTE: *The first digit in the pager display will be the first status input causing the page alert.*

980* = Turn **ON** Tone Acknowledgment (Default)

981* = Turn **OFF** Tone Acknowledgment, except for the answer and correct access code "BLEEP" prompts.

99* = Hang Up

9999* = Firmware version number

NOTE: *The following commands can only be entered in the LOCAL MODE*

9991* = Normal Operation (Default)

9992* = Radio Network program back-up mode.
The DC-8 Plus is connected to the Silence Monitor III (SM III). When the Silence Monitor III detects a loss of audio or white noise, the DC-8 Plus dials the networks auto-coupler and back feeds programming over the phone line. The DC-8 Plus also controls a 2x1 switcher, which in turn switches

from the Satellite feed to the backup phone line feed via the DC-8 Plus. When normal Satellite programming is restored, the DC-8 Plus waits 60 seconds, then hangs up and switches audio back to the Satellite.

NOTE: *This mode should disallow Relay #1 to be controlled on an initiated dial out.*

9993* = Remote broadcast recording.

RECORD = When key 1 is released, the double acknowledgment beep is sent, K1 closes for 1/2 second. (No tone is recorded)

STOP = When key 2 is released, K2 closes for 1/2 second, and then the double acknowledgment beep is sent.

Note: A good number of systems stop the record process if a short period of silence is detected. Therefore, we suggest that when using this command, it is wise to wait two seconds after finishing the recording before pressing this key, eliminating the tone being recorded.

PLAY = When key 3 is released, the double acknowledgment beep is sent. Send phone audio is turned on and K3 is closed for 1/2 second. The unit stays here until 1 minute has elapsed without a key entry or any other key has been pressed, except Keys 1, 2, which turns OFF the play function. Pressing Keys 4, 6 during this function closes their respective relays for 1/2 second.

REWIND = Key 4, Same as PLAY function, except K4.

FAST FORWARD = Key 6, Same as PLAY function, except K6.

9994* - 9995* Future

9996xxxxxxxx* Master Access code. **** = Default**

9999* = Software Version

NOTE: *Be sure to terminate all commands on this page with a (*) star.*

- To use the DC-8 Plus as a DTMF tone decoder for tones 1 through 8, follow the listed steps below.
- Jumper Status inputs one and two to the DGND terminals.
- Connect the audio output of the device to be monitored to the AUX + /- input terminals.
- Connection to the phone line and telephone are NOT required for this option.
- Put the OPERATE / LOCAL switch into the LOCAL position (IN).
- Adjust the rear panel "AUX IN" level control to accommodate proper tone detection.

NOTE: *Overloading the send or aux audio input, may cause erratic DTMF operation.*

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SPECIFICATIONS

Send Input Level:	Adjustable, Max + 24dbu, balanced 20 KΩ bridging (Input to Phone line).
Auxiliary Input Level:	Adjustable, Max + 24dbu, balanced 20 KΩ bridging (Input to DTMF detector).
Receive Output Levels:	Adjustable, Off to +4 dbu, @ 100 Ω, balanced output (Receive from phone line).
Logic:	Microprocessor, non-volatile memory, high performance DTMF transceiver.
Relays/OC:	Sealed relays, 6 – SPDT, 2 – 2PDT Bifurcated-Crossbar silver alloy with gold overlay contacts. 30 vdc @ 750 ma. Open collector (Ground Sink), 24 vdc @ 100 ma.

NOTE: *For safety, do NOT connect 120VAC circuits to the relays.*

Status/Busy:	Compatible with CMOS/TTL, open collector or contact closures. Active low. Max logic voltage 5 vdc.
Connectors:	Screw style wire captive terminals. Modular, RJ-11C/W telephone and phone line. 1- Modular cable supplied.
FCC registration:	Complies with FCC parts 15 & 68. Reg BRDUSA-36042-OT-T
Ringer equivalence:	0.4B
Power Requirements:	16 to 18 Vac, @ 600 ma. 120 Vac wall transformer. Supplied. (240 Vac 50-60 hz optional)
Size:	19" X 1.75" X 4.50" (WHD)
Weight:	3.0 lb.

LIMITED WARRANTY

The term "Buyer" as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person's or entity's own use.

Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

EXCLUSIVE REMEDIES

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer's acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools' instructions for confirmation by inspection of the defect (which at Broadcast Tools' election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

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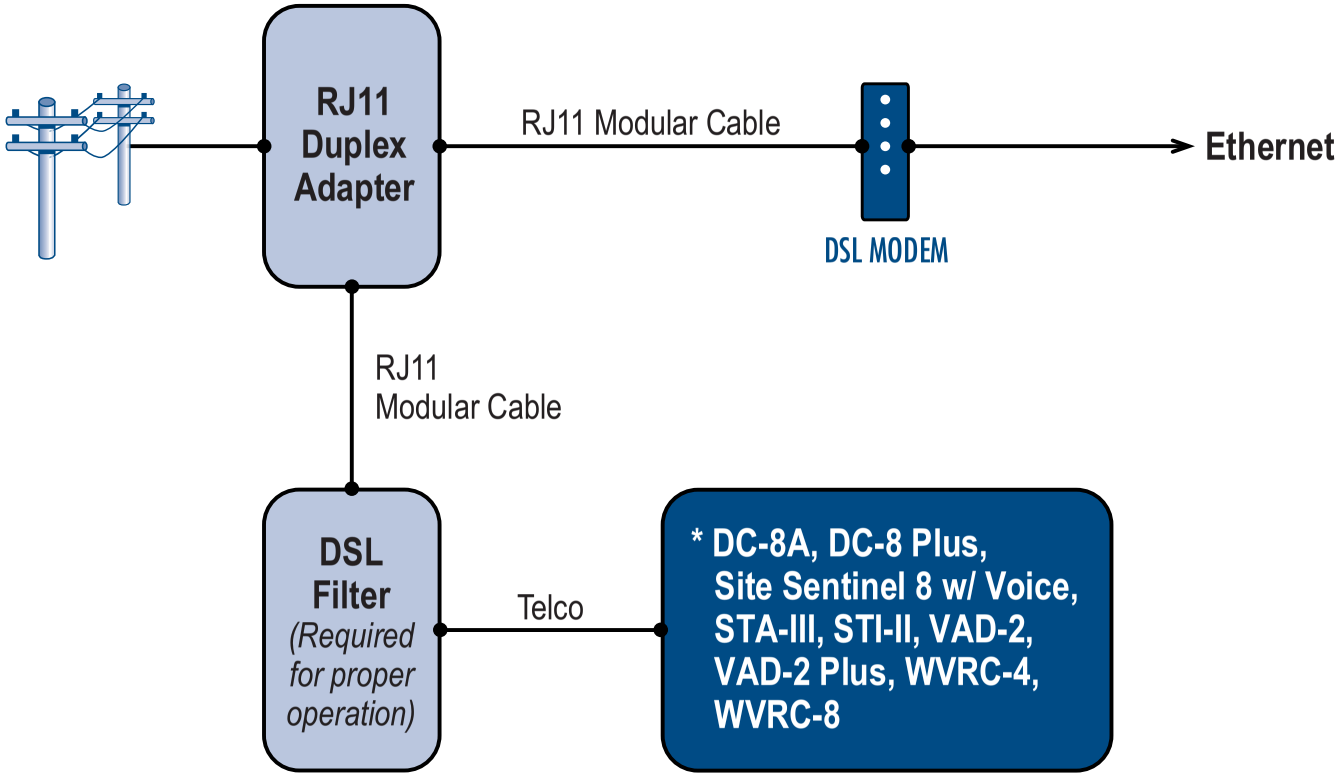
Broadcast Tools®

Connection suggestion when using listed* equipment with DSL/Telco Phone Lines.



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